

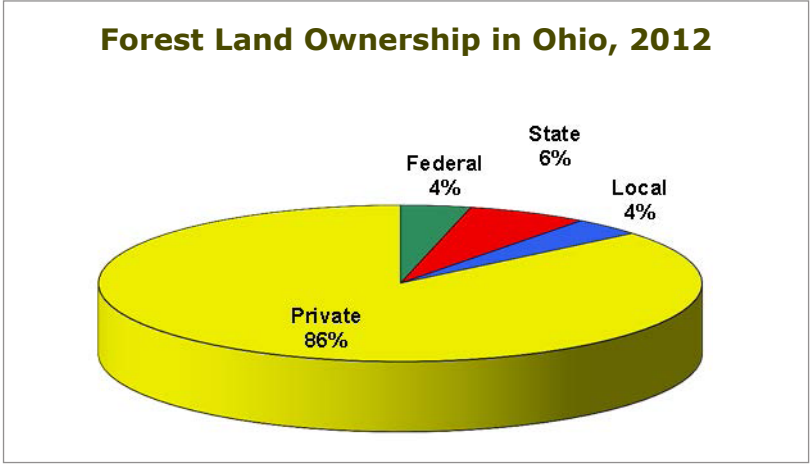
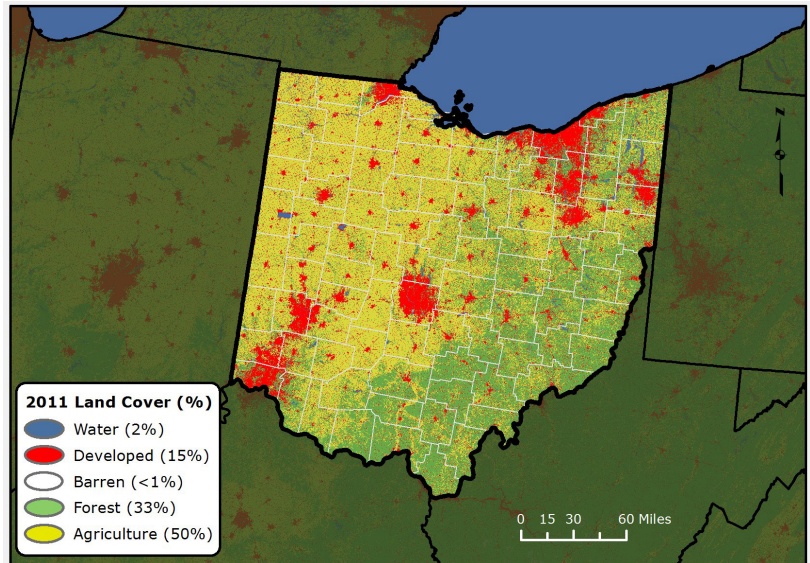


2015 Forest Health highlights

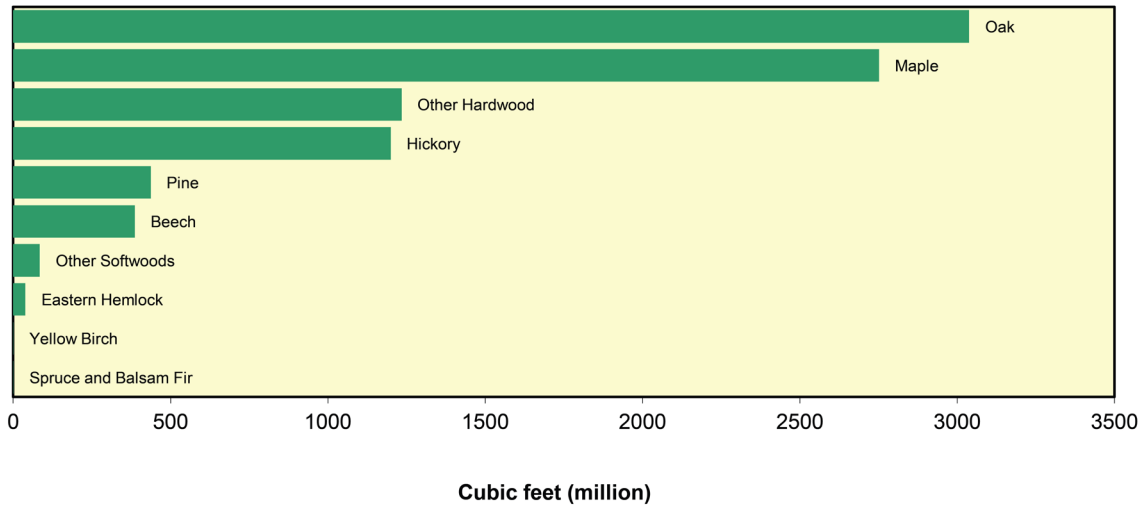
OHIO

Forest Resource Summary

Ohio encompasses 26,209,700 acres, 31.1 percent of which are forested, not including the urban forest. Forests have increased dramatically since 1940, including an increase from 7.1 to 8.1 million acres since the late 1970s. Ohio's forests are 86 percent privately owned. The predominant forest type group is oak-hickory, which occupies 63 percent of Ohio's forest land. Ohio's forest industries contribute over \$22 billion to the State's economy. The Ohio Department of Natural Resources (DNR) Division of Forestry manages 21 State Forests totaling more than 200,000 acres.



Net Volume of Growing Stock on Timberland by Species in Ohio, 2012

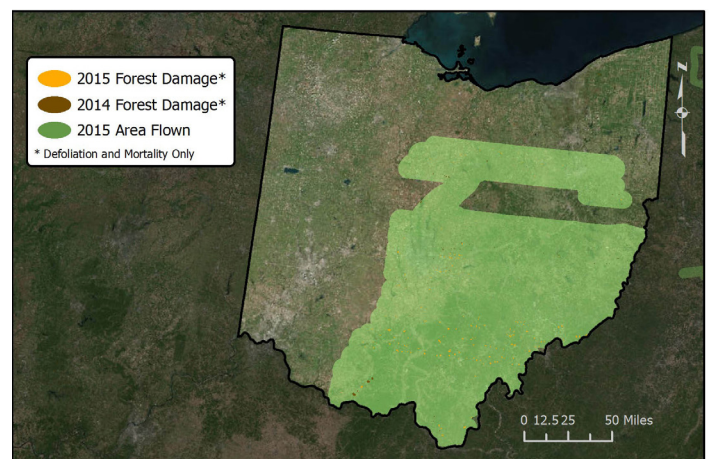


Forest Health Surveys

Each year, the Ohio DNR Division of Forestry and the Ohio Department of Agriculture cooperatively conduct an aerial survey over the majority of the State to survey Ohio's forest health. This year's survey began on June 15 and concluded on July 10. Rain and thunderstorms this spring resulted in many delayed and canceled flights. Flight lines were flown in an east-to-west direction with a spacing of about 4 miles. Each flight day, two observers were equipped with digital aerial sketchmap (DASM) computers containing a GIS/GPS mapping system. The observers identified 337 different sites from the air with discoloration, defoliation, or mortality.

Ohio DNR Division of Forestry staff inspected 103 of these sites on the ground. The top five damage-causing agents and associated acreage are in the table below:

Damage-causing agent	Acres
Yellow-poplar weevil	6,790
Emerald ash borer	5,228
Dutch elm disease	3,253
General decline	1,516
Flooding/water	1,216



Forest health survey observations in Ohio in 2014 and 2015.

State Forest Management

Ohio contains 21 State Forests that comprise more than 200,000 acres. The first State Forests were created in 1916. These managed forests range from nearly 64,000 acres to less than 500 acres; most are located in the unglaciated southern and southeastern portions of the State. Ohio's State Forests are managed for multiple uses, including sustainable timber production, wildlife habitat, soil and water protection, and recreation. Since 2010, Ohio's State Forests have been certified by the Forest Stewardship Council and Sustainable Forestry Initiative. This certification ensures that the State Forests are well managed according to strict environmental, social, and economic standards. Foresters apply the science of silviculture on State Forests and use timber harvesting as a beneficial tool. Harvesting can improve the overall health and condition of the forest by removing trees of poor health and vigor that are prone to attack from insects and disease. Harvesting can also reduce the forest's susceptibility to disturbances such as wildfire and ice storms. Through the Ohio DNR Division of Forestry's *Trees to Textbooks* program, a percentage of the revenue generated from State Forest management activity goes to the county, township, and school district in which the activity took place.

Special Issues

Yellow-Poplar Weevil

A major yellow-poplar weevil outbreak occurred in Ohio in 2015. The greatest numbers of this native insect were observed in southern and eastern Ohio. Defoliation was locally severe and resulted in many inquiries from the general public concerned about the health of their trees. Significant dieback and decline of yellow-poplars was observed. In some cases, trees that had been stressed by drought and/or previous infestations of yellow-poplar weevil or tulip tree scale were killed.



Feeding damage from yellow-poplar weevil. (Credit: Ohio DNR Division of Forestry)

Discoloration and defoliation by yellow-poplar weevil was the most prevalent type of damage mapped in the annual aerial survey with 6,790 acres indicated.

Wet Spring Weather

Ohio experienced an abnormally wet spring, which resulted in widespread effects on plant health. From March through June, Ohio's rainfall was 30 percent greater than normal. Temperatures were also slightly above normal this spring. The wet, warm weather during bud break and leaf expansion favored the growth of plant fungal diseases. Fungal pathogens such as anthracnose were particularly evident on such tree species as sycamore, silver maple, and ash. Bacterial fire blight was evident on many ornamental pears and crabapples this spring. Silver maples also produced a heavy seed crop in 2015, and the natural browning of the seeds as they matured prompted many calls from concerned landowners who mistook the brown seeds for dead foliage. In general, most trees impacted by anthracnose were able to recover and did not sustain significant decline or dieback. Drier than normal conditions were then experienced mid- to late summer, resulting in some drought stress to those plants that produced a lot of top growth due to the abundant spring rainfall and did not have equivalent root system growth.



Laricobius nigrinus beetles from the Virginia Tech Insectary ready for release. (Credit: Ohio DNR Division of Forestry)



HWA biocontrol field insectary. (Credit: Ohio DNR Division of Forestry)

Emerald Ash Borer

Emerald ash borer (EAB) has been the most devastating forest pest in Ohio in recent years, and quite possibly in history. Today, 85 of 88 counties have confirmed infestations, but EAB is suspected to occur throughout the State. In northwest Ohio, where EAB was discovered in 2002, the vast majority of native ash species have been killed. Significant mortality of ash is now occurring in central, southwest, and northeast Ohio. New county EAB confirmations in 2015 were Carroll, Gallia, Morgan, and Ross. In late 2014, a researcher at Wright State University discovered EAB infesting white fringetree. Subsequent experiments

have confirmed the ability of EAB to complete its lifecycle within white fringetree. The impact EAB will have on this southeastern U.S. native tree species needs further research. The Ohio DNR Division of Forestry is working with several partners to monitor native populations of this tree in southern Ohio. The DNR Division of Forestry continues to help woodland owners manage their forests and utilize their ash resources, assist communities that are dealing with current and future EAB issues, and work to increase public awareness about the insect.

Walnut Twig Beetle/Thousand Cankers Disease

In late 2012, walnut twig beetle (WTB), the insect vector of thousand cankers disease (TCD), was caught in Ohio DNR Division of Forestry traps in Butler County (southwest Ohio). The fungal pathogen that causes TCD, *Geosmithia morbida*, was subsequently confirmed from infested trees in Butler County in 2013. In 2014, the known infested black walnut trees were removed and examined as part of a U.S. Forest Service research project. The Ohio DNR Division of Forestry has been monitoring over 30 Lindgren funnel traps from spring through fall across the State in black walnut plantations and forested areas with a large component of black walnut. Traps were checked at least every 2 weeks, and samples are sent to Ohio State University's Ohio Agricultural Research & Development Center for analysis. The Ohio Department of Agriculture monitors over 100 traps within Butler County in addition to traps at wood-processing facilities around the State. While not all 2015 trap samples had been processed at the writing of this report, no WTB has been detected in any Ohio traps in 2015. The Ohio Department of Agriculture has quarantined Butler County to prevent the movement of potentially infested walnut material out of the county. Further research on this pest will help guide future management activities.

Gypsy Moth

The European gypsy moth increased in abundance in 2015. In Ohio, gypsy moth occurs in the majority of the eastern half of the State, with the edge of the infested area extending generally from northwest Ohio to southeast Ohio. The Ohio Department of Agriculture has quarantined 51 of Ohio's 88 counties to prevent the movement of gypsy moth out of those counties. No additional counties were added to the quarantine in 2015. In 2015, 23,532 male gypsy moths were caught in traps, a 38 percent increase from 2014. The Ohio Department of Agriculture continued its treatment efforts within the Slow the Spread transition zone with four types of treatments occurring in 2015: Gypchek (gypsy moth virus), Foray 48b (Btk bacterium), Dimilin 4L (chemical insecticide), and Disrupt II (mating disruption pheromone). A total of 3,779 acres were treated with chemical larvacide treatments (Foray, Dimilin, or Gypchek). Disrupt II mating disruption was applied to 162,287 acres. The Ohio Department of Agriculture will continue to monitor gypsy moth populations and assess treatment effectiveness.

Notable occurrences

Oak Pests

Several pests of oak species were widely reported throughout the State in 2015. An unknown "leaf curl syndrome" of oaks was widely reported on both red and white oaks across the State, but most came from the glaciated northern and western halves of Ohio. This syndrome has been observed periodically in Ohio for the last several years, and there is no obvious insect or disease responsible. Occurrence of the disease seems to sometimes be correlated with cold temperatures during bud break and leaf expansion. Indeed, some parts of Ohio did experience a late frost over one to two days in mid-May. The majority of these trees did not produce a new flush of leaves and did not experience significant

dieback or decline. Damage by oak shothole leafminer was very common across Ohio this spring. While the effects of this fly species were obvious, they did little or no harm to their host oak species. Oak lace bug populations were high in late summer, but, like the oak shothole leafminer, had little to no effect on tree health. Effects of other late-summer oak pests that were very apparent were the "flagging" caused by oak twig girdler and pruner beetles. The chewing by the adults and larvae of these insects resulted in the breakage of small terminal twigs of oaks that often hang on the tree and hold their dead leaves. Again, the effects of these insects had little impact on individual tree health.

Beech Decline

An as yet unidentified decline of American beech has been observed for the last several years in northeastern Ohio, centered on Lake County. The decline is first expressed as banding of dark interveinal leaf tissue and progresses to leaf curling, callousing, and disfigurement. Eventually branch dieback and lack of bud production are noticed. Personnel from several groups and agencies including the U.S. Forest Service State and Private Forestry, Ohio DNR Division of Forestry, Ohio Department of Agriculture, Ohio State University, USDA APHIS PPQ, Lake County Metroparks, Cleveland Metroparks, and Holden Arboretum have been investigating this decline and continue to monitor decline progression.



*Leaf discoloration associated with American beech decline.
(Credit: Ohio DNR Division of Forestry)*



Branch dieback associated with American beech decline. (Credit: Ohio DNR Division of Forestry)

Non-native Invasive Plants

Non-native invasive plants are a threat to the biodiversity of forests throughout Ohio. Some forests are already declining due to severe infestations of invasive plants such as *Ailanthus*, bush honeysuckles, autumn-olive, multiflora rose, and Japanese stiltgrass, while other areas remain largely uninvaded. As part of an ongoing study, an aerial survey to delineate infestations of the invasive *Ailanthus*, or tree-of-heaven, is planned for the late fall of 2015 within and around the Wayne National Forest and State Forests in southeast Ohio. Resulting infestation maps will be developed and used to target *Ailanthus* control efforts on the ground. The Ohio DNR Division of Forestry has partnered with researchers from the U.S. Forest Service Northern Research Station to examine the efficacy of *Verticillium nonalfalae*, a soil-borne fungus, as a potential biocontrol for *Ailanthus*. The Ohio DNR Division of Forestry promotes invasive plant control by working with Ohio's only Cooperative Weed Management Area, the Appalachian Ohio Weed Control Partnership, and on private land through its Service Forestry Program and through other outreach events.

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Forest Health Programs

State forestry agencies work in partnership with the U.S. Forest Service to monitor forest conditions and trends in their State and respond to pest outbreaks to protect the forest resource.

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